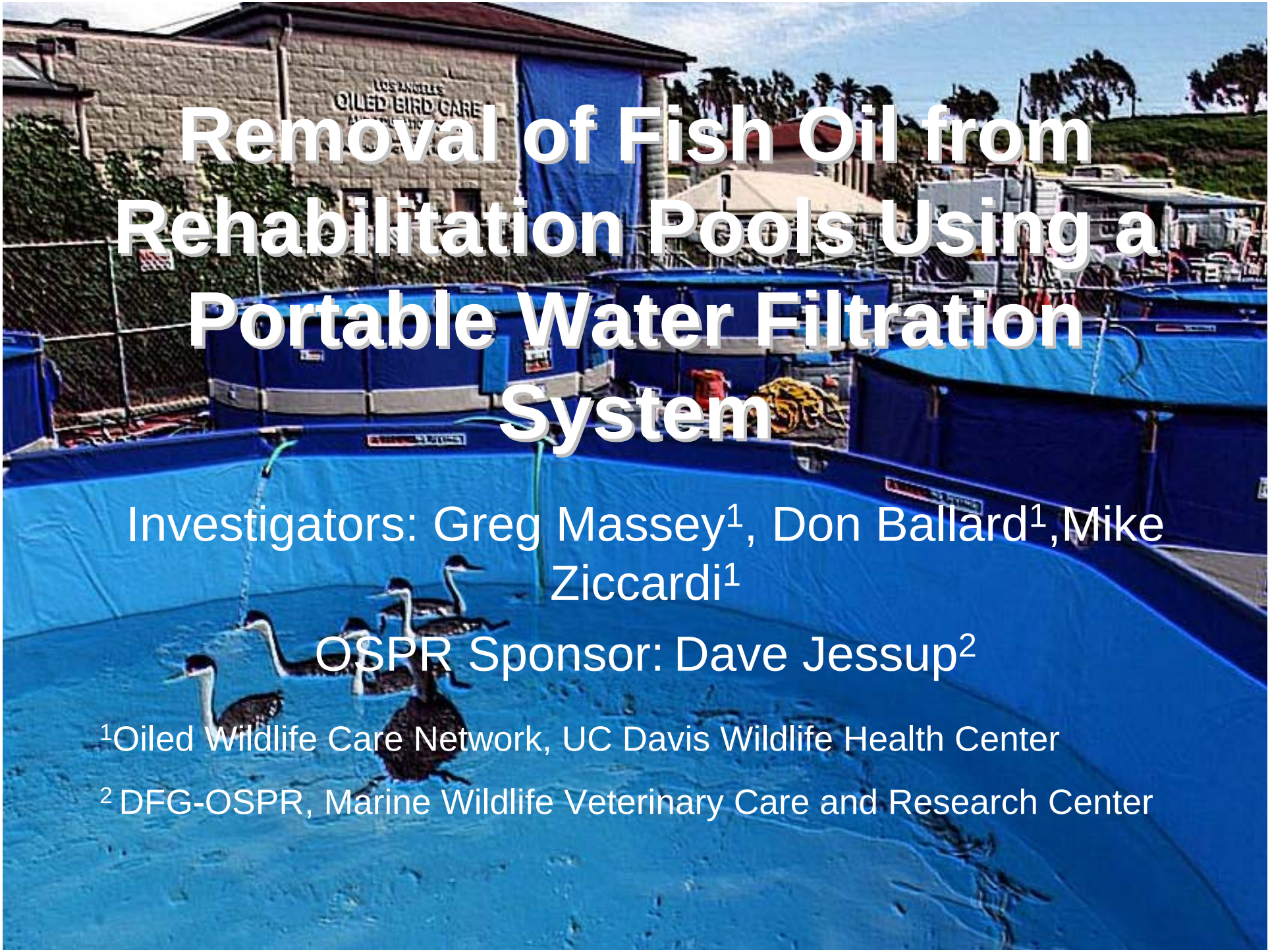
Removal of Fish Oil from Rehabilitation Pools Using a Portable Water Filtration System

The amount of fish oil waste and wastewater generated in seabird rehabilitation pools needs to be reduced to prevent contamination of feathers from re-circulated water, and lower the costs associated with generating wastewater. This presentation evaluates the effectiveness of using a custom-designed portable filtration unit to remove fish oil from a marine rehabilitation pool.



Removal of Fish Oil from Rehabilitation Pools Using a Portable Water Filtration System

Investigators: Greg Massey[1], Don Ballard[1],Mike Ziccardi[1]

OSPR Sponsor: Dave Jessup[2]

[1]Oiled Wildlife Care Network, UC Davis Wildlife Health Center

[2] DFG-OSPR, Marine Wildlife Veterinary Care and Research Center

Background

- After decontamination, oiled birds are moved to outdoor rehabilitation pools to regain waterproofing and improve body condition
- Diet in pools = fish
- Excrement contains digested fish oils that can re-contaminate feathers

Current Solution

Materials and Methods

- Filter Specialists X100 housing
- Oil adsorbing filter bag (25µm)

Original Study Plan

- 3 volumes of fish oil added to rehabilitation pool with closed filtration loop
- Field test at SFBOWCEC


Trial 1


3
1
FSI


0
5
10
15
20
25
30
35
40
45
50
55
60
psi
psi
ASHCROFT®
595-05

K9 SHINE

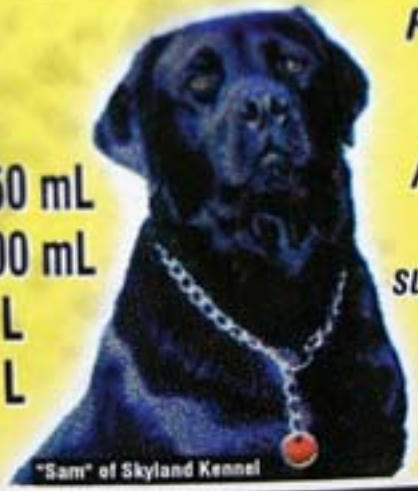
FISH OIL

K9 SHINE is an all-natural product derived from fish. ***K9 SHINE*** helps in the grooming and general good health of our friends.

Store at room temperature out of direct sunlight. Suggested serving: Add to food, 1 tsp. or 5 mL per 30 lbs/ 13.6 Kg of your dog's body weight per day.

Lazer's Pet Supplies
Woods Harbour, Shelbourne Co.
NS B0W 2E0 Canada
Email: ggoreham@klis.com

☐ 250 mL
☐ 500 mL
☐ 1 L
☑ 4 L



"Sam" of Skyland Kennel

All natural nutrition supplement

K9 SHINE est une dérivé d'un produit naturel, le poisson. ***K9 SHINE*** aide à la bonne santé de nos compagnon.

Garder à la température de la pièce hors de rayons du soleil. Portion proposée: Aux aliments de tous les jours, ajoutez 5 mL par 30 livres 13.6 Kg du poids de votre chien.

Best Before/Meilleur Avant:
DEC 2005

Contains Marine
OMEGA-3

Calculating Dose of Oil

- 4.34g of oil extracted per 10.64g of fish*
  - ~40% of fish weight
- Estimated 1kg of smelt fed / COMU / 24h
- 40% of 1000g = 400g
- 400g ~ 400ml

*Adeniyi, O.D. 2006. Herring fish (*Clupea harengus*) oil production and evaluation for industrial uses. J Disp Sci & Tech. 27:537-541.


OHAUS
PORTABLE Advanced

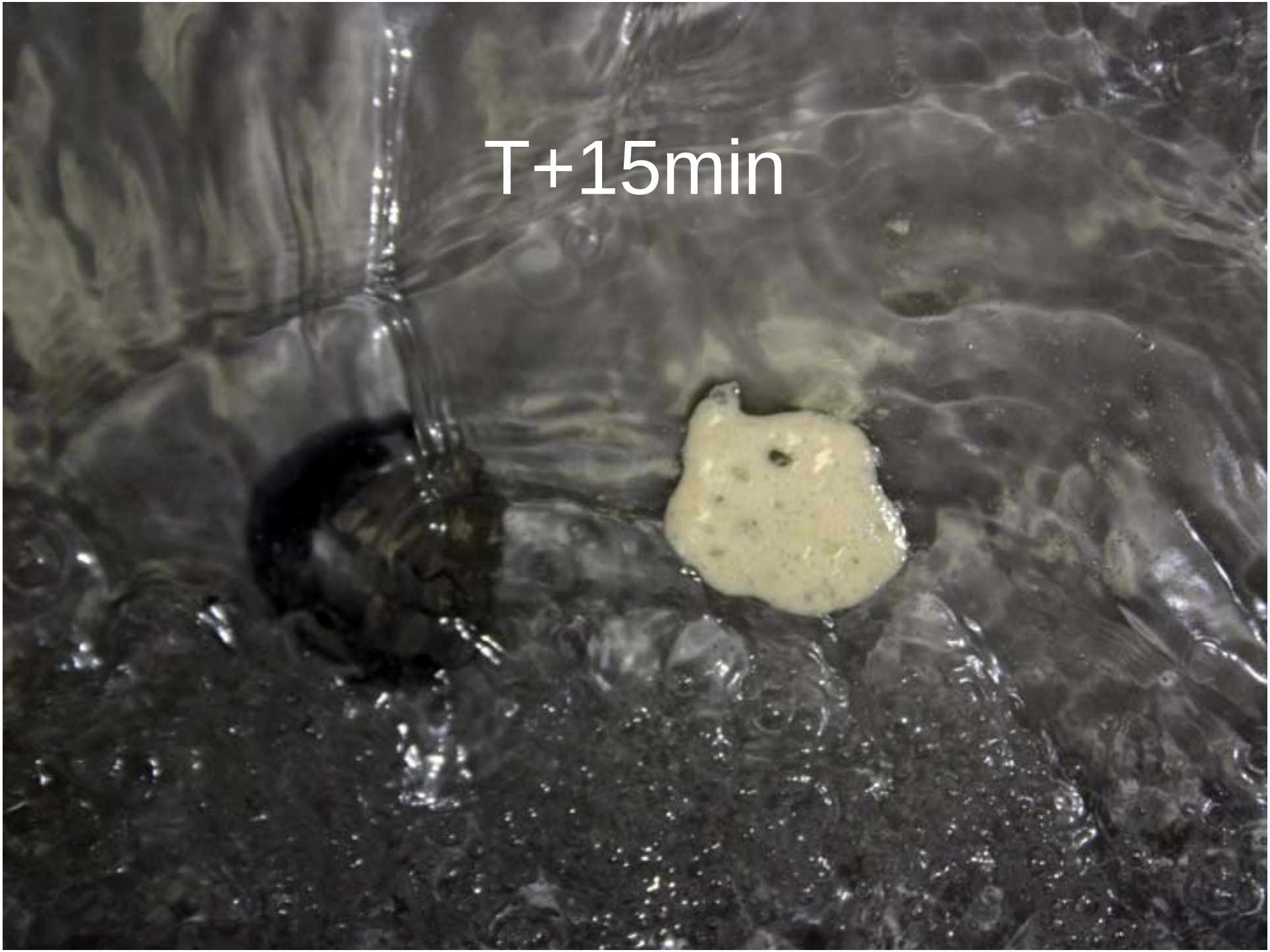
Water Sampling

- Water samples collected from pool inflow and outflows
- 0min, 5min, 15min, 30min, 60min,120min, 240min, and 24h after oil added

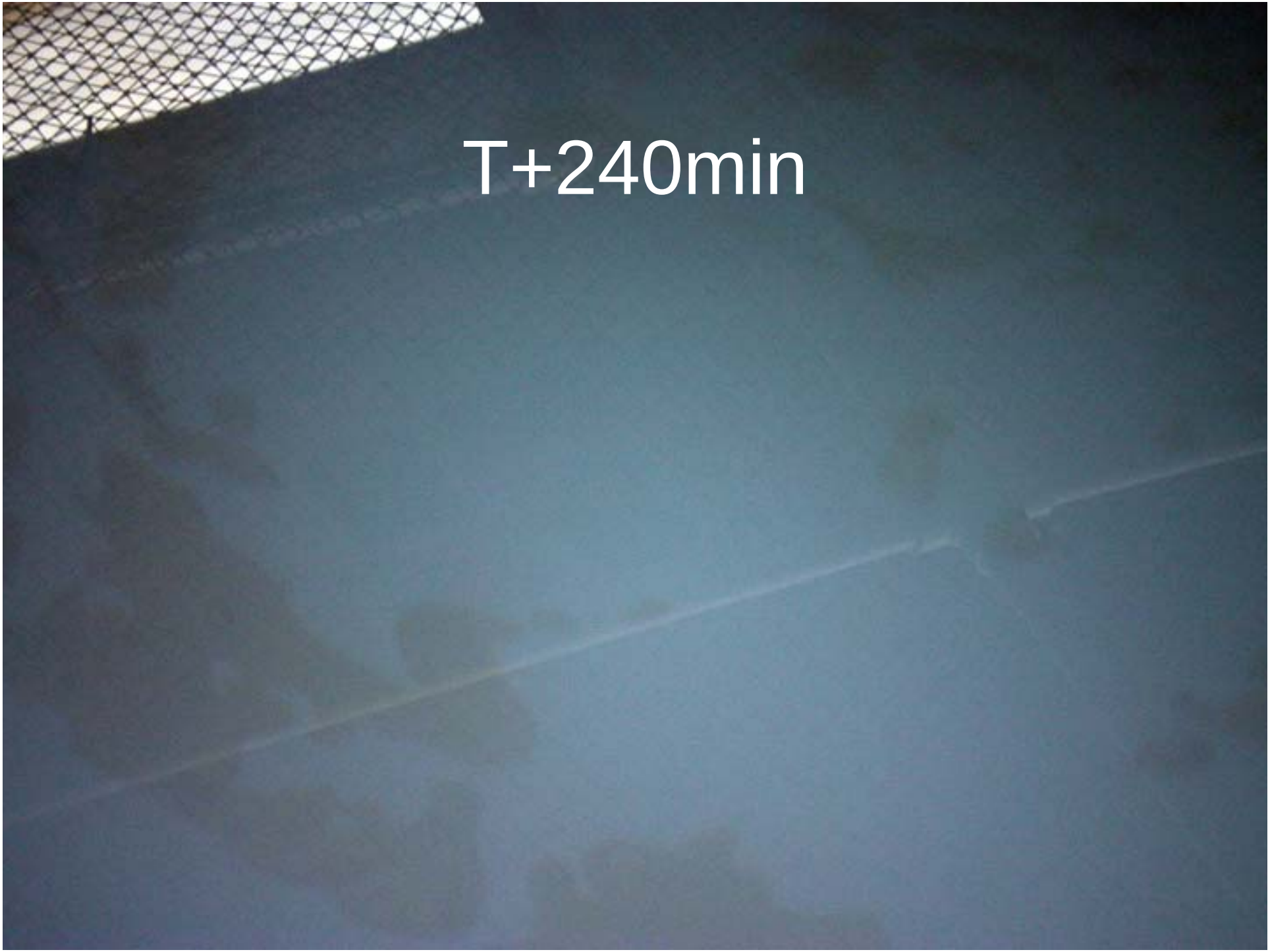

T+0
3


3


T+15min


T+15min


T+240min


T+240min

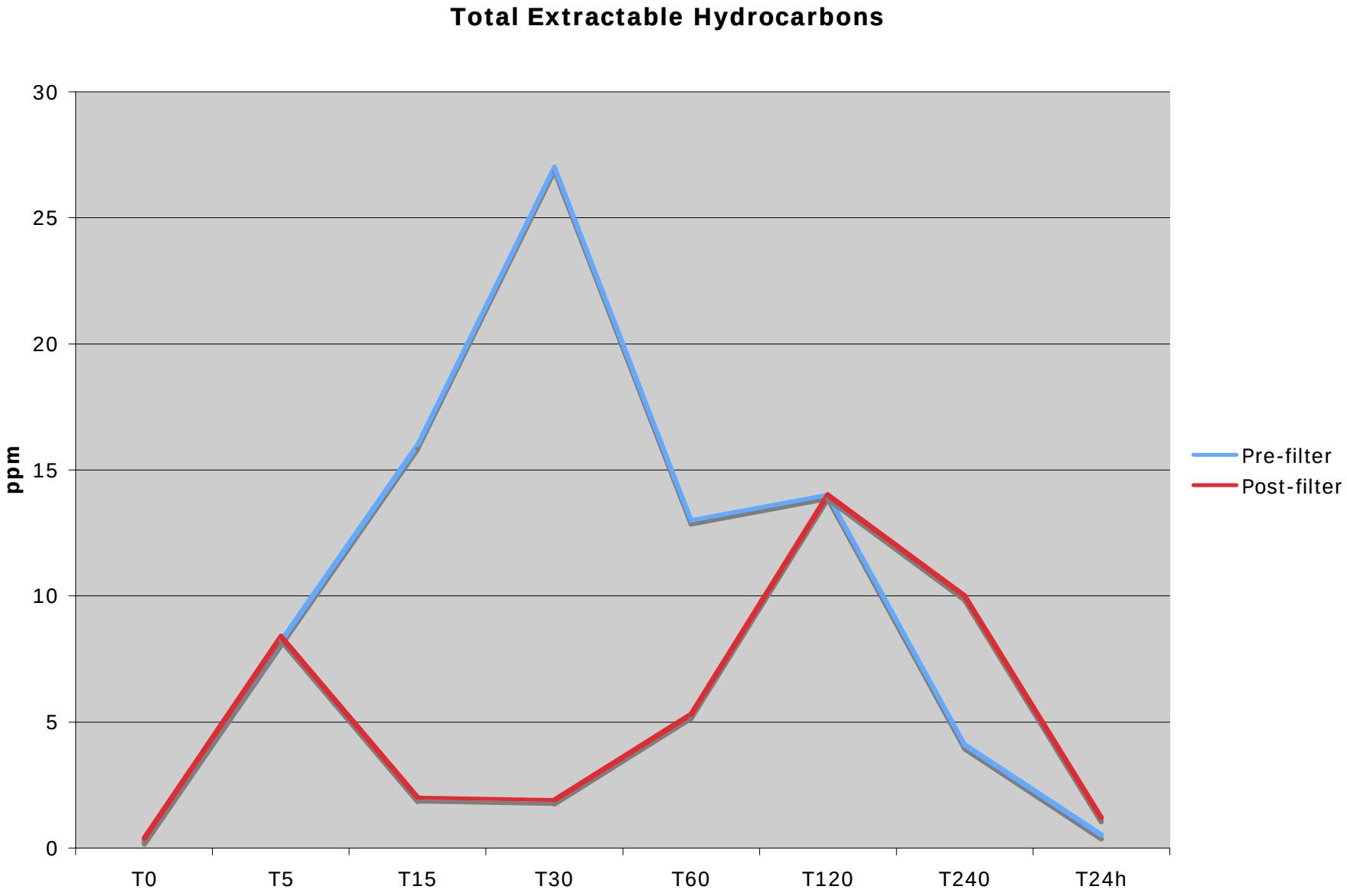
T+24h

- Water clarity in pool was excellent
- Light sheen of oil visible in water of filter housing


T+24h

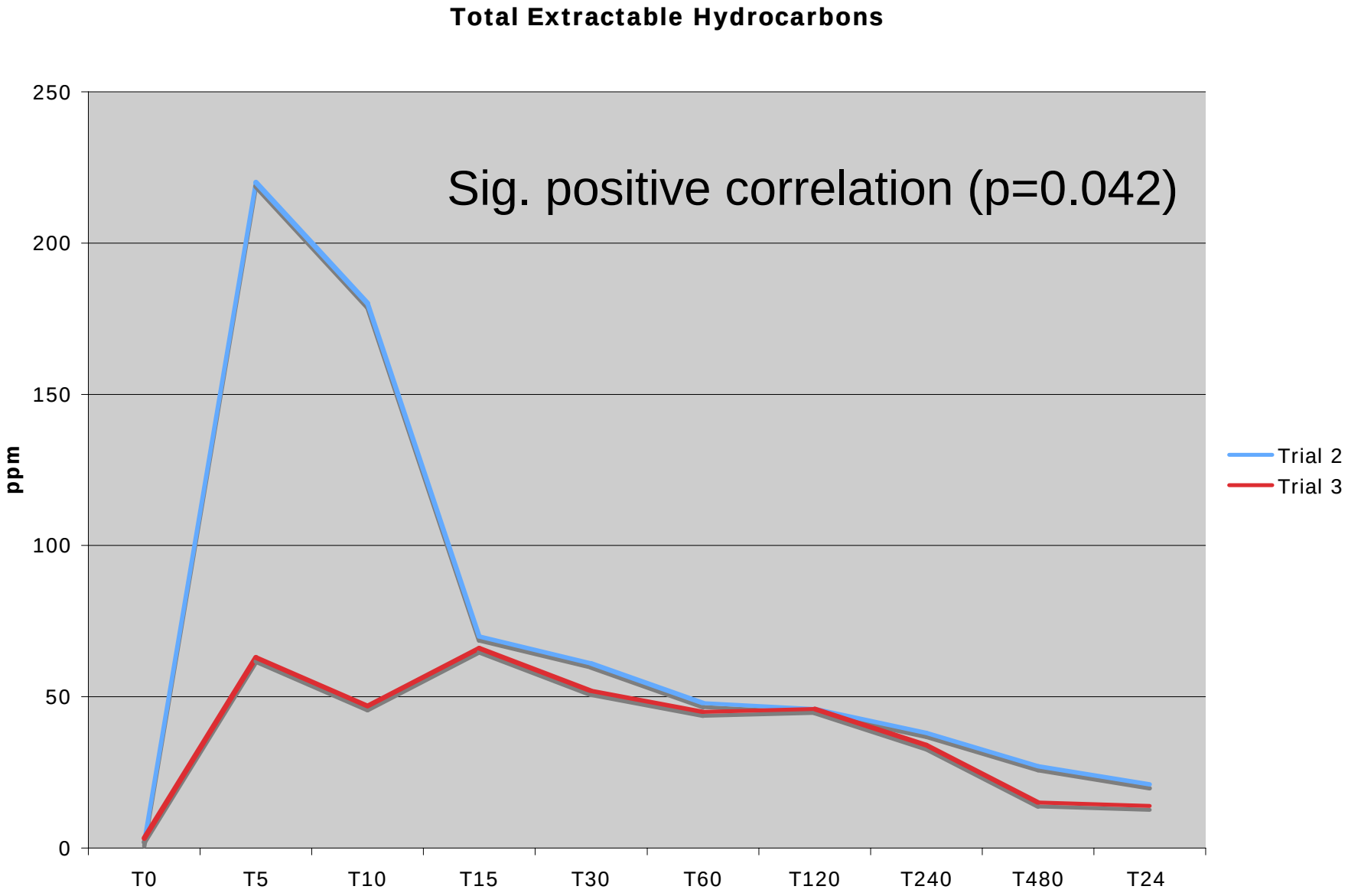
Trial 1 Results

- Filter pressure
  - No change through T+240min
  - At T+24h
    - X100 increased by 1psi
    - Sand decreased by 2psi


Total Extractable Hydrocarbons
ppm
30
25
20
15
10
5
0
T0
T5
T15
T30
T60
T120
T240
T24h
Pre-filter
Post-filter


Trial 2


Trial 3
Absorbent®
W™
RETRIEVES OIL ON WATER
WHERE
WHAT
WHY


Total Extractable Hydrocarbons
Sig. positive correlation (p=0.042)
ppm
250
200
150
100
50
0
T0
T5
T10
T15
T30
T60
T120
T240
T480
T24
Trial 2
Trial 3

What's Next?


Questions?